Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Discovery Education: Evidence of Evolution Simulation:**

**Fossils- Activity 1**

**START HERE:**

Real-World Connection\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ it supports have both \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_over \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. How did \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ figure out what happened? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ study Earth's \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_by studying the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of past \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_in the \_\_\_\_\_\_\_\_\_\_\_\_\_.Each \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rock layer was formed at a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in Earth's \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tell us a lot about the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_that were \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at the time the layer was \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in which they lived. This can allow us to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ how many \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ago the rock \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.What You're InvestigatingIn this simulation, you will investigate how \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ piece together the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of Earth's \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. First, you will interpret the \_\_\_\_\_\_\_\_\_\_\_\_\_ age of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ section of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rock layers. Then you will determine the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_age of those \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_they contain.

**Background:**

Relative AgeBy \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rock \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, scientists can determine the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in which the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ formed. The \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_ of rock layers describes the \_\_\_\_\_\_\_\_\_ in the \_\_\_\_\_\_\_\_\_\_\_\_ they \_\_\_\_\_\_\_\_\_\_\_\_\_\_. The \_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ states that, when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rock layers are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, they are laid down \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The \_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ says that the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sedimentary rock\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ will be on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_layers will be on the \_\_\_\_\_\_\_\_\_\_\_\_\_. Of course, because of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ activity, many \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are no longer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, making \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of layers by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ more difficult. Absolute Age\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ know that the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_found in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ differ because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ has changed through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Therefore the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_present in a \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can be used to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ age of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This is referred to as the \_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Fossils also give \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_information about \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ life and about how \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_have \_\_\_\_\_\_\_\_\_\_\_\_\_\_over time.

Change Over Time\_\_\_\_\_\_\_\_\_evidence supports the theory of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_selection by showing how certain \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ over time. Through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_, a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ changes over time by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ species \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_than \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ species. The less-adapted species often \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or become \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Questions:**

1. How is relative age different from the absolute age of a geologic or evolutionary event?

2. How can scientists know what happened millions of years ago if no one was there to see it?

3. How does the fossil record provide evidence that life has changed over time?

4. Let's say you find a fossil in a layer of shale. How might you determine the age of the shale?

5. How might the types of fossils found in a million year old layer of rock differ from fossils found in a 200 million year old layer?

**Evidence of Evolution Simulation**

Activity 1

Introduction

Index fossils help tell geologists the relative age of the rock layers in which they occur. An index fossil is one that is widely distributed and found in many different areas. It must also represent an organism that paleontologists agree existed in a specific geological period and only in that period.

The trilobite is an example of an index fossil. Trilobites were alive for about 255 million years – that is the entire Paleozoic Era. But there were many distinctly different trilobites. Compare the three trilobites below. Even if you can’t see a difference, paleontologists can.

**Directions:**

Using the Evidence of Evolution simulation, find other index fossils. You may have to hunt for a while, going through many different rock samples. Remember, that is how geologists and paleontologist work.

**Procedures:**

1. From the Main Screen select the Simulations icon. Then click the Evidence of Evolution icon.

2. Click on the Start Here button and read the text. If you need more information, click and read the Background. Close the window when you are done.

3. Look at the graphic of rock formations. From the pull down menu, select the formation A- X that was formed first. Repeat this for the remaining layers.

4. Once you have identified the relative age of the rocks, you see a text box that asks if you are ready to identify fossils found in the layers. Click on OK.

5. Use the chart at the left of the rock cross-section to help you determine the geological age of the fossil. Click on your selection from the pull down menu. Repeat this until you have identified all the fossils and the period in which they found. Record any index fossils that you find below.

6. Repeat the simulation, moving on to other rock cross-sections until you find at least three index fossils.

7. Complete the chart below with the fossils that you find.

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| --- | --- |
| **Index Fossil** | **Period** |
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|  |  |

8. Do you think that you would like to be a paleontologist, searching for fossils? Why?